A Workflow Model for Adapting E-Charts in Specialty Clinics

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Modeling of health professionals' activities and matching of these processes to applied information technologies are necessary for acceptance and optimal utilization of a clinical information system. The overall objective of this study was to describe the different processes involved in current clinical practice of neurologists and to estimate the extent by which these processes are standardised across neurologists. Results from this study will be used to optimise the deployment of a stroke *e*-record and provide insight on some of the characteristics that will need to be addressed.

To describe the care processes, we developed a workflow model that encompasses five different perspectives; the *what* (types of activities being done, the *when*, the *how* (the communication mode), the *who* (the person best identified to do the activity), and the *where* (the place the activity is done). We observed four neurologists during clinic time, in a stroke care/prevention out-patient clinic at McGill University Health Center (MUHC) and monitored the type, frequency and sequence of their activities as well as the communication mode they used to report or access information. Activities were categorized within the following; History, symptom assessment, physical exam, medication and treatment plan. Communication processes were categorized as one or any combination of; in person, paper, telephone, computer or dictaphone. To enhance validity and reliability, patient's visits were recorded by a single nurse observer.

To date, 94 patient's visits have been observed. Of these, 72.3 % were follow-up cases with an average visit time of 16.9 (9.1) minutes. New cases who had been admitted for their stroke to the MUHC represented 22.3 % of the patients and had a mean visit time of 24.8 (7.6) minutes compared to new cases who were non-MUHC patients who accounted for 5.3 % of patients but had the longest visit time 34.4 (9.8) minutes. Neurologists spend most of their time during the visit conducting the physical exam (3.5 ±1.8 min), irrespective of the type of visit. Recording medication was the least time-consuming activity requiring only 1.2 ±0.87 minutes. To date, our results indicate that neurologists spend 26 % of their time, communicating verbally with their patient/family. Only 5.3% of the time is spent charting with no interaction with the client, most of the charting being done while talking to the patient (60 %). The computer and telephone are used less than 3 % respectively during a patient's encounter. We did not see any meaningful differences in the time spent per activity or in the sequence of activities across neurologists.

While data is still being collected, interesting conclusions can be drawn from these preliminary results. The low level of use of computers with labs and images reports will need to be carefully addressed for the *e*-record to be accepted and used. On the other hand, time spent on gathering/recording information on medication and medical history, which accounts for 30% of any visit time, is likely to be seen as an added-value to neurologists who will see updated information on their computer screen once the *e*-record will be fully deployed within the Health Center. Finally, the surprising amount of chart documentation that occurred while talking to the patient suggests that careful attention will need to be directed to the implementation of the stroke *e*-record to avoid disruption in the doctor-patient relationship.